Digital Solutions for Accelerating Good Health and Well-being in Latin America and the Caribbean: Mapping Intervention Points for SDG 3

by Hanyu Wang

1 Introduction

As the 2030 Agenda approaches, Latin America and the Caribbean (LAC) faces significant challenges to sustainable development. ECLAC's latest analysis shows that only 23% of SDG targets are on track, while 41% progress too slowly and 36% have stalled or regressed. Growth is undermined by structural barriers, such as low productivity, high inequality, and weak institutional capacity.

In particular, shortcomings in public health systems (SDG3) affect individual well-being but also inhibit broader economic competitiveness. By improving access to quality health services, digital technologies, especially Artificial Intelligence (AI), offer promising opportunities to address these gaps. This report analyzes the current landscape of SDG 3 in LAC and outlines data-driven, digital policy recommendations to enhance health and well-being across the region.

2 Analysis of SDG 3 (Enhancing Good Health and Well-being) in LAC

Despite progress in some areas, Latin American and Caribbean health is now a multidimensional concept encompassing social, cultural, economic, and environmental factors. The realization of universal access to good-quality healthcare and well-being for all ages remains hampered by longstanding structural and systemic issues.

Different health systems in the region have historically evolved along distinct lines, resulting in markedly different health systems. Public sector services, social security schemes, and private health care all serve different segments of the population, leaving the most vulnerable behind. Only a few examples, such as Brazil's Unified Health System (SUS)[1], offer truly universal coverage. Healthcare quality and access are inequitable, resulting in disparities in healthcare outcomes. Rural populations, low-income families, and indigenous populations

[1] Machado, C. V., & de Lima, L. D. (2024). Brazil's Unified Health System: the fight for a universal right in an unequal country. *salud pública de méxico*, *66*(5), 726-731.

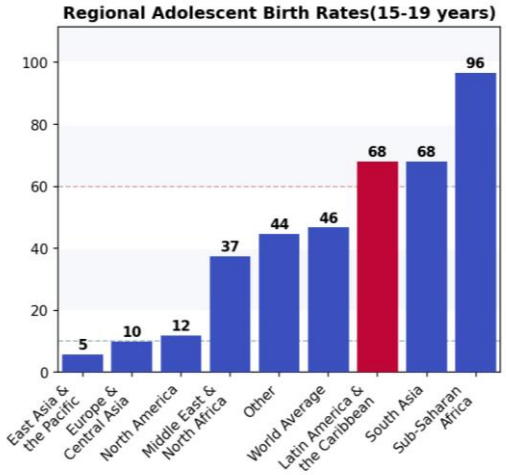
are at a disadvantage when it comes to receiving comprehensive, timely, and efficient healthcare. SDG 3 targets face the following challenges:

2.1 Maternal and Reproductive Health

2.1.1 High Adolescent Fertility

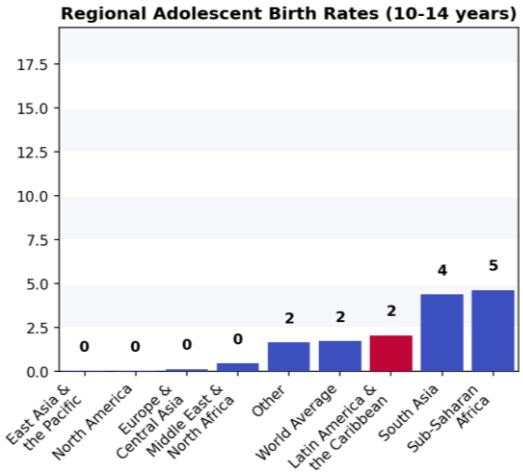
Despite showing a reduction since 2000, Latin America and the Caribbean (LAC) presented the second-highest adolescent fertility rate (AFR) in 2022, with 68 births per 1000 women aged 15-19 (Figure 1).

Figure 1. Regional Adolescent Fertility Rate (15-19 years) in 2022.



It ranks third globally in motherhood incidence among adolescent girls (Figure 2), especially among indigenous populations and rural areas.

Figure 2. Regional Adolescent Fertility Rate (10-14 years) in 2022.



Several factors contribute to teenage pregnancy and early motherhood, including poverty and limited economic opportunities. This, in turn, affects the health and development of young mothers as well as perpetuates the cycle of poverty.

2.1.2 Maternal Mortality Trends

Almost half of the maternal mortality rate increase among 17 countries globally since 2016 has occurred in Latin America and the Caribbean, with differences observed between sub-regions (e.g., higher rates in the Caribbean compared to Central America)[2]. LAC maternal death rates increased by 15% between 2016 and 2020, erasing two decades of progress. By 2020, there will be 88 maternal deaths per 100,000 live births[3]. In the region, nine out of ten maternal deaths are caused by high blood pressure, severe bleeding, and unsafe abortion practices. Increasing access to quality maternity care and modern contraception could prevent nine out of ten maternal deaths.

2.2 Infectious Diseases and Sexual Health

2.2.1 Rising HIV Incidences

In 2023, there were an estimated 4 million people with HIV in the Americas, of which approximately 2.7 million lived in Latin America and the Caribbean. Approximately 120,000 new HIV infections are estimated to occur in Latin America from 2010 to 2023, an increase of 9%. From 2010 to 2023, the number of new cases in the Caribbean dropped by 22%, from approximately 19.000 to 15.000. Certain subpopulations (key populations) of the Region are more likely to be affected by the HIV epidemic, including MSMs, transgender women, and female sex workers[4]. In Latin America, these three key populations make up more than half of all new infections, and in the Caribbean, they make up almost half of all new infections. This trend calls for better sex education and the expansion of sexual and reproductive healthcare services to ensure early diagnosis and treatment.

2.2.2 Ongoing Threats from Communicable Diseases

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[2] World Health Organization. (2023). *Trends in maternal mortality 2000 to 2020: estimates by WHO, UNICEF, UNFPA, World Bank Group and UNDESA/Population Division*. World Health Organization.

[3] World Health Organization, UNICEF, UNFPA, World Bank Group, & UNDESA/Population Division. (2023). *Trends in maternal mortality 2000 to 2020* [Maternal mortality ratio (modeled estimate, per 100,000 live births)]. Geneva: World Health Organization. Retrieved April 15, 2025, from https://www.who.int/data/gho/data/indicators/indicator-details/GHO/adolescent-birth-rate-(per-1000-women-aged-15-19-years)

[4] Garnett, G. P. (2021). Reductions in HIV incidence are likely to increase the importance of key population programmes for HIV control in sub-Saharan Africa. *Journal of the International AIDS Society*, *24*, e25727.

The region continues to contend with endemic diseases like cholera, dengue, and Chagas disease, as well as emerging threats like Zika and chikungunya[5]. The prevalence of these diseases is often disproportionately high in vulnerable populations. They often lack access to adequate healthcare services, which makes it difficult for them to receive timely diagnosis and treatment. Moreover, limited health education and resources can further exacerbate the spread of infectious diseases within these communities, along with social and economic barriers, such as stigma and poverty.

2.3 Non-Communicable Diseases (NCDs) and Mental Health

2.3.1 Growing Burden of NCDs

With nearly two-thirds of adults being overweight and substantial increases in childhood obesity documented over recent decades, obesity has reached alarming levels in LAC. Besides increasing the risk of type 2 diabetes, which is projected to rise dramatically in the coming decades, these trends also contribute to a rise in chronic diseases such as cardiovascular disease[6]. Although countries like Mexico and Chile have implemented proactive measures like taxes on sugar-sweetened beverages and mandatory food warning labels, these measures have not been sufficient alone[7]. These conditions persist, so comprehensive strategies are needed that include urban planning, improvements to school and family environments, improved regulations of food marketing, and initiatives that promote physical activity from a young age.

2.3.2 Mental Health Concerns

Mental health issues are on the rise, especially among young people in marginalized communities. It is most common to suffer from depression and anxiety disorders. Latin America and the Caribbean are home to 16 million people, more than Los Angeles, New York City, and Chicago combined, who suffer from mental disorders. Similarly, suicide, sometimes the result of severe mental illness, is among the leading causes of death among

[5] Santos, L. L. M., de Aquino, E. C., Fernandes, S. M., Ternes, Y. M. F., & Feres, V. C. R. (2023). Dengue, chikungunya, and Zika virus infections in Latin America and the Caribbean: a systematic review. *Revista panamericana de salud publica = Pan American journal of public health*, *47*, e34. https://doi.org/10.26633/RPSP.2023.34

[6] Gallardo-Rincón, H., Cantoral, A., Arrieta, A., Espinal, C., Magnus, M. H., Palacios, C., & Tapia-Conyer, R. (2021). Type 2 diabetes in Latin America and the Caribbean: Regional and country comparison on prevalence, trends, costs and expanded prevention. *Primary Care Diabetes*, *15*(2), 352-359.

[7] Popkin, B. M., & Reardon, T. (2018). Obesity and the food system transformation in Latin America. *Obesity reviews : an official journal of the International Association for the Study of Obesity*, *19*(8), 1028–1064. https://doi.org/10.1111/obr.12694

people under twenty, with a 6 percent increase between 2000 and 2019. In addition, mental health programs receive less than 2% of total health budgets and are overly reliant on centralized psychiatric institutions, contributing to this unmet need are cultural stigmas, underfunding, and overreliance[8]. Factors such as socioeconomic disparities, global crises (like pandemics and natural disasters), and adverse early-life experiences exacerbate mental illness. These challenges add another layer to the health and social care system's complexity.

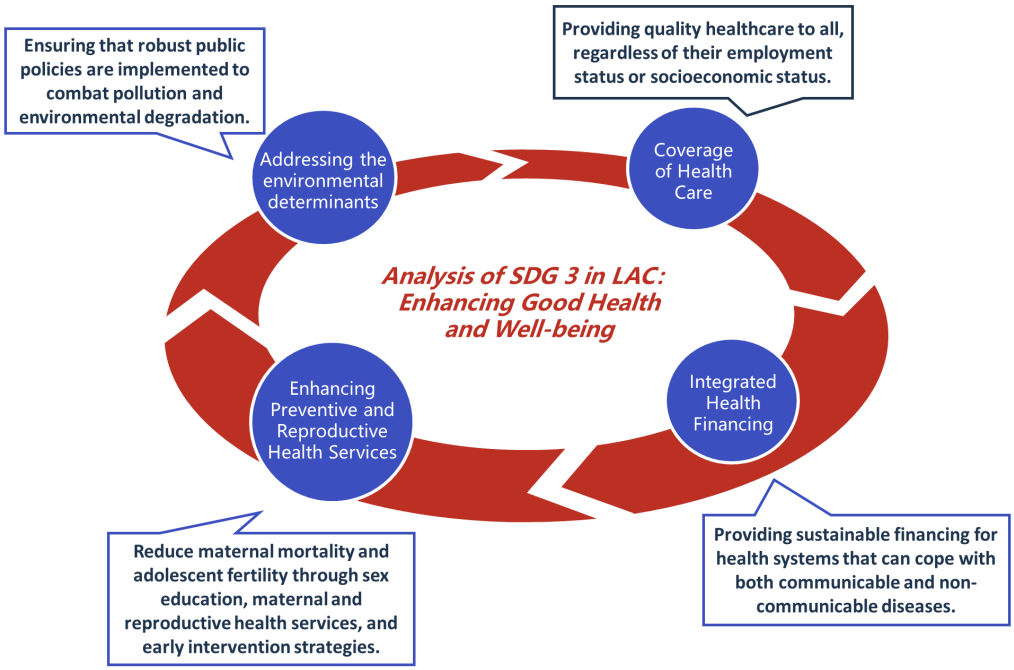
2.4 Environmental Health Factors

2.4.1 Impact of Pollution

Particularly in regions with limited waste management resources, air and water pollution pose severe public health and environmental risks. In the case of plastic waste, which is estimated to amount to nearly 17,000 tons each day, environmental pollution is not only limited to conventional air pollutants, but also includes plastic debris that impairs water quality and disrupts terrestrial ecosystems[9]. When plastic waste is incinerated, it can cause increased flooding and respiratory hazards due to the breeding grounds for disease vectors and impede drainage systems. Children and older adults are particularly vulnerable to these environmental health threats, which underscores the urgent need for comprehensive policies to mitigate these risks and safeguard public health.

Figure 3 shows the key recommendations for achieving SDG 3 in LAC.

[8] Teti, G. L., Rebok, F., Rojas, S. M., Grendas, L., & Daray, F. M. (2014). Systematic review of risk factors for suicide and suicide attempt among psychiatric patients in Latin America and Caribbean. *Revista Panamericana de Salud Pública*, *36*(2), 124-133.
[9] Husaini, D. C., Mendez, R. K., Arzu, M., & Harris-Thurton, L. (2024). Plastic Waste in Latin America and the Caribbean (LAC): Impact on the Environment and Public Health—A Systematic Review. *Journal of Toxicology*, *2024*(1), 5698516.



3 Leveraging AI and Digital Technologies for Transformation

To achieve SDG 3, Latin America and the Caribbean must adopt a multifaceted approach that incorporates digital innovation into health system reforms. The following framework outlines key digital interventions to address critical health challenges:

3.1 Expanding Health Care Coverage in LAC

Digital technologies offer a promising pathway to bridge existing gaps in health care coverage across Latin America and the Caribbean (LAC):

3.1.1 Remote Consultation and Diagnostic Services

By leveraging advancements in artificial intelligence and real-time data analytics, telemedicine platforms enable remote consultations and diagnostics, reducing travel burdens for patients and the need for immediate on-site medical personnel. In addition to increasing access to medical expertise in rural communities, telemedicine optimizes

resource allocation during public health emergencies[10]. Video conferencing, cloud-based analytics, and wearable devices can be used to evaluate patients remotely.

Several LAC telemedicine projects have previously been funded by the World Bank, the Inter-American Development Bank, and bilateral aid agencies. It is possible to reduce costs by partnering with technology companies (for example, China's investment in telehealth platforms).

Mexico and Brazil These countries could emphasize integrating telemedicine with large public health systems (e.g., expanding Brazil's SUS telehealth networks) to reduce overload on urban hospitals. Machine learning-based pilot projects can be prioritized in Colombia where epidemiologic surveillance is a key priority [11]. A lightweight, cost-effective telemedicine solution (possibly smartphone-based) should be deployed in low-income countries.

3.1.2 Patient Engagement and Self-Management Platforms

Developing and launching mobile health (mHealth) apps tailored to local languages and cultural contexts can improve continuity of care in LAC. Apps that combine mHealth apps with wearable devices that can collect biometric data should include online appointment booking, chronic disease management tools, and interactive health education. By using community health workers to promote app usage and support digital literacy initiatives, vulnerable and low-income populations can benefit from continuous feedback loops and alerts.

For National Health Programs, governments can redirect funds into digital tools from paper-based systems. By leveraging the synergies between microfinance and mobile banking, Latin America and the Caribbean could adopt a model similar to that of Kenya, allowing mobile health insurance wallet projects to be funded by mobile money providers.

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[10] Senbekov, M., Saliev, T., Bukeyeva, Z., Almabayeva, A., Zhanaliyeva, M., Aitenova, N., ... & Fakhradiyev, I. (2020). The recent progress and applications of digital technologies in healthcare: a review. *International journal of telemedicine and applications*, *2020*(1), 8830200.

[11] Wilson, D., Sheikh, A., Görgens, M., Ward, K., & World Bank (2021). Technology and Universal Health Coverage: Examining the role of digital health. *Journal of global health*, *11*, 16006. https://doi.org/10.7189/jogh.11.16006

In Argentina and Chile, focus on patient engagement tools that are tailored to urban and semi-urban populations. In island nations and rural areas with intermittent connectivity, emphasize low-cost, accessible mHealth solutions.

3.1.3 Integrated Health Information Systems

Data sharing among health providers across various levels of care needs to be streamlined by implementing interoperable Electronic Health Records (EHRs). Establish EHR networks, develop national standards for EHR interoperability. Secure, scalable cloud infrastructures can support large amounts of health data while ensuring privacy and data integrity. Partner with technology providers to develop customized solutions that integrate with existing systems. Implement training programs to upskill health workers with EHRs and data analytics. Budgets for digital transformation or health modernization should be allocated. Similar to Estonia's successful e-Health system, encourage PPPs that leverage expertise and technology from global IT companies.

Countries like Chile and Uruguay, which have advanced ICT sectors, can emulate Estonia's integrated EHR system to improve coordination and reduce health disparities. Developing low-cost, modular digital systems for resource-constrained countries is important.

3.2 Integrating Health Financing in LAC

3.2.1 Secure Digital Payment Platforms

Create dedicated web portals and mobile applications that integrate with existing national health insurance systems to streamline the collection of premiums from health insurance companies and public health financing. As well as ensuring data protection, these platforms must adhere to international standards in terms of encryption and security protocols. A sustainable UHC is achieved through improved financial inclusion, reduced transaction costs, faster premium collection, and improved allocation of health financing resources.

3.2.2 Data-Driven Resource Allocation

Analysis of healthcare spending patterns, forecasting demand, and allocation of limited funds using advanced machine learning and AI algorithms. Using this strategy, health systems can reallocate resources dynamically to meet critical needs. Use AI models to forecast future healthcare needs by mining large healthcare databases and analyzing

expenditure patterns. Visualize key performance indicators (KPIs) for health financing and enable real-time reassignment of funds using interactive dashboards.

Data infrastructure upgrades and analytics platforms should be allocated a portion of the annual budgets from the National Health Insurance Funds and Ministry of Health Budgets. Collaborate with local universities and research institutes to develop models, which reduces costs through funding arrangements.

Brazil and Mexico, countries with large-scale health insurance systems, can benefit from data analytics by refining resource allocation within public and social health insurance pools. Predictive analytics can help Costa Rica target interventions such as early screening for chronic diseases, avoiding later treatments that are more expensive.

3.2.3 Blockchain-Enabled Transparency and Accountability

Track health financing flows using blockchain technology, reduce fraud, and enhance accountability in resource use by creating transparent, tamper-resistant systems. Establish a blockchain-based platform for managing health financing transactions—from premium payments to claims processing, Ensure that blockchain platforms can interface seamlessly with existing digital health tools (e.g., EHRs and digital payment apps) for end-to-end transparency, Start with pilot implementations in selected regions or health insurance programs to test efficacy and scalability before broader rollout. Funds can be allocated from health budgets or created specifically for blockchain integration in health financing.

3.3 Enhancing Preventive and Reproductive Health Services in LAC

3.3.1 Digital Health Education and Outreach

Digital platforms are used to deliver comprehensive reproductive health and sex education. Create interactive web portals and mobile apps incorporating multimedia formats (videos, interactive quizzes, infographics) to accommodate diverse literacy levels. Customize content to local cultural contexts and language preferences. Digital curricula in Brazil and Mexico might incorporate local health narratives and regional statistics, while Caribbean countries might prioritize low-bandwidth solutions that deliver essential educational content over mobile networks. Develop co-creation content in collaboration with local NGOs, educational institutions, and public health agencies. Providing cost-effective mobile solutions with simple and accessible user interfaces for Caribbean islands with low

bandwidth networks. Digital health initiatives can be supported by multilateral donor agencies and regional funds, including the Pan American Health Organization (PAHO) and the Inter-American Development Bank (IDB).

3.3.2 AI-Driven Predictive Analytics for Maternal Risk Management

Through artificial intelligence, early-warning systems are developed to identify high-risk pregnancies. Create and validate AI-driven predictive models for maternal health risks in countries with established health data infrastructure (e.g., Chile, Colombia). To improve predictive accuracy of models, combine data from wearable sensors with electronic health records (EHRs) by using a feedback loop that allows models to learn over time from new data, ensuring that risk predictions remain accurate despite changes in demographics and health trends.

3.4 Addressing Environmental Determinants in LAC

3.4.1 Smart Environmental Surveillance and Analytics

Monitor metrics such as particulate matter, chemical contaminants in water, and waste accumulation in critical urban areas (industrial zones, densely populated slums, coastal regions). Develop a centralized AI analytics platform to collect, process, and visualize environmental data. Integrate cloud-based solutions for scalability and continuous monitoring.

3.4.2 Community-Driven Reporting and Engagement Platforms

Develop digital platforms that facilitate community reporting of environmental issues, enabling quicker governmental responses and greater public participation in environmental health governance. Using geotagged data and photos, create mobile and web-based applications for residents to report environmental hazards (e.g., water contamination, poor waste management). To increase accessibility and facilitate real-time alerts, integrate these platforms with social media channels. Provide training to local health workers and community leaders on how to use these tools.

4 Conclusion

In conclusion, the analysis demonstrates that digital technologies, especially AI-driven solutions, hold great promise for accelerating progress toward SDG 3. Digital interventions can transform health service delivery and promote equity by addressing health inequalities, maternal and reproductive health, communicable and non-communicable diseases, and environmental determinants. Using national budgets, multilateral agencies (e.g., PAHO, IDB, World Bank), and public-private partnerships, along with country-specific implementation plans, this digital transformation can be both sustainable and tailored to local needs.

5 Data and Code Availability

All datasets and analysis code used in this report are publicly available at: https://github.com/hildahanyuwang/ECLAC/tree/main/report